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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,577	10/31/2003	Tapesh Yadav	037768-0159	1118
22428 7590 06/20/2007 FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			EXAMINER LE; HOA T	
			ART UNIT 1773	PAPER NUMBER
			MAIL DATE 06/20/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<div style="border: 1px solid black; width: 150px; height: 20px; margin: 0 auto;"></div> <p style="text-align: center;">Office Action Summary</p>	Application No.	Applicant(s)	
	10/698,577	YADAV ET AL.	
	Examiner	Art Unit	
	H. T. Le	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-52 is/are pending in the application.
- 4a) Of the above claim(s) 36,37 and 41-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-35 and 38-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restrictions

2. This application contains claims 36, 37, and 41-52 drawn to an invention nonelected without traverse.

Claim Rejections - 35 USC § 112

3. **Claims 16-35 and 38-40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.**
 - 3.1 The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support in the specification for the claim limitation "compositional uniform" nanomaterial. The terminology is not found in the originally filed specification explicitly or implicitly. Therefore, the new limitation "compositional uniform" is considered new matter and should be canceled.
4. **Claims 16-35 and 38-40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement as set forth in the previous office actions and further discussed below.**

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4.1. The specification as originally filed does not provide a process step of combining a dopant into the lattice of a metal compound. Lattice is an ordered arrangement. Therefore, the metal compound has to be a crystalline material in order to have a lattice structure. The specification refers to mixing a dopant to a metal compound to form an emulsion. It cannot be seen how the dopant is combined into the "lattice" of the metal compound from a simple mixture, where the lattice is non-existing. The instant specification does not provide support for the process to obtain such structure. In addition, although a doping process in a solution is disclosed, the specification provides no support for a general "combining process" which is broader than the specific process of 'doping in a solution'. Therefore, the claims are based on a non-enabling disclosure.

4.2. Applicant argued that the process of "combining a dopant into the lattice of a metal compound" can be found at "paragraph 89- et seq. of the present specification" where it refers to U.S. Pat. No. 5,851,507 and US Pat. No. 5,851,507. The materials cited by Applicant discuss a mixture of a metal compound and a dopant to form an emulsion. No crystal structure is discussed, thus no lattice is present. And because no lattice is present in the metal compound, it cannot be seen how the dopant is incorporated into a non-existing lattice of the metal compound.

5. Claims 16-35 and 38-40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement as set forth in the last office action and further discussed below.

5.1. The specification does not provide a process for 'creating nanoscale particles' from a mixture as claimed.

5.2. Applicant argued that the process of "creating nanoscale particles" is taught in the commonly-owned U.S. Patent 5,788,738 ('738 patent), particularly as detailed in examples 1 through 9. The method disclosed in the '738 patent is not the same as the claimed method. The '738 patent method involves making ultrafine (nanoscale) particles from a commercially available powder. The instant claims, on the other hand, recite a method of making nanoscale particles from a mixture, not from a particulate material. Therefore, the '738 patent does not provide support for the production method of nanoscale powder as claimed.

5.3. Applicant further argues that the support for the claimed method is provided by the commonly owned U.S. patent 5,984,997 ('997 patent). Similarly, to the '738 patent, the '997 patent discloses method of making nanoscale powder from a powder, not from a mixture as recited in the present claims. Therefore, the '997 patent does not provide support for the production method of nanoscale powder as claimed.

6. Claims 16-35 and 38-40 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a combustion process of an emulsion to obtain nanoscale particles, does not reasonably provide enablement for any method other than combustion. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

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6.1. The originally filed specification and the incorporated references describe a combustion process for forming a nanopowder. The instant claims recite no combustion or method from which nanopowder is formed. There is no support either from the commonly-owned patents (US'738, US'997 & US'507) or from the present specification that the claimed nanopowder can be formed from a method other than combusting a metal-containing emulsion. The instant claims which fail to include such limitation (combustion of an emulsion) to form a nanomaterial are deemed broader than the enabling disclosure.

Claim Rejections - 35 USC § 102

7. Claims 16-35 and 38-40 are rejected under 35 U.S.C. 102(b) as being anticipated by the Schmidt patent (US 5,590,387) and the Lawandy patent (US 5,882,779 as set forth in the last office action and further discussed below.

Examiner's Note: Because the specification does not provide description as to how a dopant can be "combined into the lattice" of the metal compound, for purpose of art rejection, the examiner interprets this process step broadly as a combination of the dopant to a compound by any means including surface-modifying, treating, coating, etc....

The Schmidt patent ('387):

7.1 Applicant argues that "'387 does not teach or offer any motivations for combining dopant into the lattice of a metal compound comprising compositions of matter as called for in independent claims 16 and 26." As stated in the last office action, '387 teaches

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metal-containing nanoparticles being surface modified by a surface-modifying agent. Dopant is a small quantity being added to a compound to change the property of the compound. Thus, the surface-modifying agent constitutes dopant because it changes the surface properties of the nanoparticles. Thus, it is necessarily inherent that the dopant (i.e. surface modifying agent) is combined into the lattice of the metal particles (see examiner's note above), especially after the modified particles were subject to sintering.

7.2. Applicant further argued that: "Regardless of how the Examiner views doping, the surface coatings on the particles of Schmidt cannot be viewed as "substantially compositionally uniform." The specification provides no antecedent basis as well as definition of "compositionally uniform". Therefore, "substantially compositionally uniform" can be interpreted as having no or little impurity that does not affect the main composition of the particles. In this case, the coated particles have been sintered. Sintering is a process known in the art to provide uniformity on the surface of a material. Therefore, the material taught by Schmidt is necessarily "compositionally uniform."

The Lawandy patent ('779)

7.3. Applicant argues that '779 teaches semiconductor cores being coated with certain transition metals and thus does not provide and the coating processes do not teach or offer any motivations for combining elements into the lattice of the metal compound. The coating material constitutes a dopant, and for the dopant to form a coating on the semiconductor core, it is expected that the dopant "combined into the lattice" of the semiconductor core. Note that the specification provides no description as to the

combination step; therefore, this step can be interpreted broadly as combination of the dopant into a material.

7.4. Applicant further argued that: "Regardless of how the Examiner views doping, the surface coatings on the particles of Schmidt cannot be viewed as "substantially compositionally uniform." The specification provides no antecedent basis as well as definition of "compositionally uniform". Therefore, "substantially compositionally uniform" can be interpreted as having no or little impurity that does not affect the main composition of the particles. In this case, the coated particles as made by Lawandy's method would necessarily result in little or no impurity; therefore, they are 'substantially compositionally uniform'.

Response to Arguments

8. Applicant's arguments filed April 12, 2007 have been fully considered but they are not persuasive for the reasons set forth above. However, the amendment has overcome the rejection based on the Hampden-Smith patent.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. T. Le whose telephone number is 571-272-1511. The examiner can normally be reached on 10:00 a.m. to 6:30 p.m., Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. Thi Le/
H. (Holly) T. Le
Primary Examiner
Art Unit 1773

June 15, 2007